

AN EXTRAORDINARY CASE OF SUPERSATURATION
IN THE FREE AIRBy J. JAUMOTTE, Director, Royal Meteorological Institute of
Belgium(Abstracted from *Ciel et Terre*, XLI, no. 3, March, 1925, pp. 42-49, 3 figs.)

An airplane flight for meteorological observation on June 11, 1924, carried out by the institute in the course of its daily sounding of the atmosphere, revealed a very unusual moisture condition at an altitude of some 5,000 meters. The plane having passed through, at 4,500 and 4,800 meters, respectively, rain and fairly dense hail, on reaching 5,000 meters an icy deposit varying from 6 to 10 cm. in thickness was observed to form on the forward edges of the wings and struts, the atmosphere at the time seeming to be perfectly clear. The deposit appeared to be rime, except that the forward part of it was composed of transparent ice. There had been no deposit previous to arriving at 5,000 meters.

The deposit seems to have lasted about seven minutes, this estimate being based on the fact that the meteorograph curves indicated a closing of the ventilating apertures by ice for that length of time, following which the apertures were again free due to evaporation of the deposit. The speed of the plane during the time the ice existed was 130 km. per hour.

At this speed, in seven minutes the plane traveled 15,000 meters. Therefore for each cm.² of area of cross section of a strut, a volume of air of 1.5 m.³ was passed through, capable at saturation and at a temperature of -15° C. of containing 2.2 gm. of water. Assuming for a deposit 6-8 cm. thick a deposit per cm.² of strut area of 5 gm., this would indicate a relative humidity of 325 per cent.

The existence of water vapor to the extent thus demanded is inadmissible. Moreover, owing to the streamlining of the struts, etc., only a very small part of the volume of air involved could come into contact with the surfaces. It must be concluded, then, that in spite of the "clearness" of the atmosphere it nevertheless contained extremely minute subcooled water droplets, which were precipitated upon the struts because inertia forced them out of the deflected air stream which passed the struts.

The basis of the author's belief in the possibility of the existence of such invisible droplets is explained mathematically and with reference to J. J. Thomson's theories on condensation and to those of C. T. R. Wilson on the appearance of fog in the absence of large ions as condensation nuclei.

The author's conclusions are:

1. Air may at certain altitudes be completely deprived of the usual condensation nuclei (dust, large ions, certain residual water droplets).
2. The quantity of water (vapor *plus* invisible droplets) contained in that air may reach a value corresponding to an extreme supersaturation, and consequently small ions in it may in certain cases form nuclei for the production of lofty clouds (C. T. R. Wilson). It is likely that supersaturation is an exceptional phenomenon at 5-6 km., but may occur frequently at mean cirrus level.—B. M. V.

MILD WINTER (1924-25) IN NORTHWESTERN EUROPE

The winter of 1924-25 in France, the British Isles, and Scandinavia was a mild one, especially in northern Scandinavia.

From an article by M. Charles Rabot in *La Nature*, February 7, 1925, and from press dispatches, we excerpt the following.

At Oslo [Christiania] the mean temperature for December, 1924, was 6° C. above normal—the greatest excess in a century.

The extraordinary temperature of 6.8° C. (44.2° F.) was recorded near North Cape on January 21, 1925. In all Norway snowfalls were infrequent and the very unusual spectacle of a snowless Christmas was presented in the greater part of the country. Lack of snow has paralyzed the work of removing cut timber in southern Norway and elsewhere in the Baltic basin. Cutting has been accomplished as usual, but it has not yet been possible to arrange for sledding it to the banks of streams down which it is floated to shipping ports.

In England the winter was remarkable, more for the heavy rain than the cold. A cold blustery spell, however, set in during the first half of March.

In Copenhagen the past winter is said to have been the mildest in three centuries.—A. J. H.

BIBLIOGRAPHY

C. FITZHUGH TALMAN, Meteorologist in Charge of Library

RECENT ADDITIONS

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

Abbot, C. G., and others.

Provisional solar-constant values, August, 1920, to November, 1924. Washington. 1925. 38 p. illus. 24½ cm. (Smithsonian misc. coll., v. 77, no. 3.)

Alexander, William H.

Climatological history of Ohio. [Columbus. 1923.] 745 p. front. illus. (maps, ports). 23 cm. [Ohio state univ., Columbus. Engin. exper. sta. Bull. no. 26.]

American automobile association.

Snow removal. Washington. [c1924.] 32 p. map. 30½ cm.

Ångström, Anders.

On continuous radiation records and their bearing upon geophysical problems. Göteborg. 1924. p. 130-134. illus. 24 cm. (Extr.: *Förhandlingar 17 skandinaviska naturforskarmötet i Göteborg*, 1923.)

Bauer, Louis A.

Terrestrial magnetism and electricity at the Madrid meeting, October 1924. Baltimore. 1924. 10 p. 25 cm. (Internat. geod. & geophys. union. Sec. terr. mag. & elec. Bull. no. 4.)

Bowman, Isaiah.

Desert trails of Atacama. New York. 1924. v, 362 p. front. illus. plates. maps. diagrs. 26 cm. [Rainfall of the desert, p. 40.]

Commission internationale des renseignements synoptiques.

Groupe d'essai pour l'observation du ciel. n. p. n. d. chart. 21½ cm.

Geigel, Richard.

Wetter und Klima, ihr Einfluss auf den gesunden und auf den kranken Menschen. München. 1924. iv, 419 p. 21½ cm.

Gutiérrez-Lanza, M[ariano].

Huracan sin precedente octubre 1924. Habana. 1924. 16 p. plates. 23½ cm.

Hamilton, J. O.

Some weather studies. Manhattan, Kansas. 1909. 22 p. illus. 23 cm. (Agric. educ. v. 2, no. 1, Sept., 1909.)